

Credit as a Factor Influencing Farmland Values: What Does the Evidence Show?

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The latest farmland boom-bust cycle of the 1970's and 1980's caused agricultural economists to search for an adequate explanation. Some viewed the farm sector's excessive use of mortgage credit as a major contributor to the boom in farmland prices above what the sector's earnings picture would support. A look at the literature on factors determining farmland values, speculative farmland price bubbles, and the role of farm mortgage credit yields a remarkable lack of consensus. Mortgage credit is only one of numerous variables affecting farmland values. Moreover, it is difficult to isolate credit as a single variable, and results are split regarding its contribution to farmland price booms.

Introduction

This article examines and places into perspective the agricultural economics literature regarding the influence of credit use on the farmland market. The article briefly summarizes the numerous research efforts to explain farmland values and then examines the literature on credit's role in inducing the 1970's farmland price boom.

Agriculture has evolved into one of the more capital-intensive sectors of the U.S. economy and is significantly dependent on credit financing. Farm real estate--valued at \$656 billion in 1993--comprises about three-fourths of all wealth held by the U.S. farm sector.

Farm real estate is not only a productive asset but is also an important source of loan collateral. The latest ERS data on farmland transfers in 1989 showed that 4.6 percent of parcels and 3.5 percent of rural land acreage transferred hands that year. USDA data for 1993 show that debt was incurred on 60 percent of farmland transfers. Debt was 72 percent of the purchase price on debt-financed transfers and institutional lenders extended some 70 percent of the credit used in purchasing farmland that year. Total farm business real estate debt was \$77.2 billion at yearend 1994.

For decades, agricultural economists were conditioned to expect a close relationship between farm income and land values. During the 1950's increases in per acre farmland values began to accelerate even during years when farm income was steady to lower, thus putting to the test long-held theories. Researchers at first were puzzled by this paradox, but they eventually came to recognize that their earlier perspective had been too narrow. Their tendency to limit their analyses to those economic forces operating within the farm sector had hampered a fuller understanding of past and current trends. Subsequent efforts proceeded to explain farmland price changes on the basis of broader economic trends and uses of land originating outside the farm sector. It was

recognized that earlier assumptions were oversimplified and that value judgments affecting the farmland market were handled inadequately.

Per acre farmland values kept trending upward during the 1960's. But buoyed by a number of factors, such as an export boom, they skyrocketed during the 1970's and early 1980's. From 1970 to the 1982 peak, U.S. farmland value per acre jumped 319.9 percent, compared with a rise in the implicit price deflator of 138.1 percent (figure A-1). This boom was followed by a 27.2-percent decline during 1982-87 before a slow upward trend resumed.

This strong boom-bust cycle intensified the search for an adequate explanation among researchers. One perspective is that the excessive use of mortgage credit by the farm sector was a major contributor to the boom in farmland prices above what the farm sector's earnings picture would support. The data show that while U.S. per acre farmland values increased 319.9 percent from 1970 to a peak in 1982, total farm business real estate loans rose 270.1 percent. In 1982, farm mortgage loans of the Farm Credit System (FCS) were up 580.1 percent and the subsidized real estate loans of the Farmers Home Administration (FmHA--made a part of the Consolidated Farm Service Agency in 1994) were up 280.6 percent from 1970. The increases are viewed as evidence by some that farm mortgage credit had been too easy to obtain. The opposing perspective, however, is that lenders and farmers made rational decisions on the use of credit after 1970 based on the prevailing market forces. The latter group's view is that problems arose when market fundamentals changed radically in the late 1970's and early 1980's.

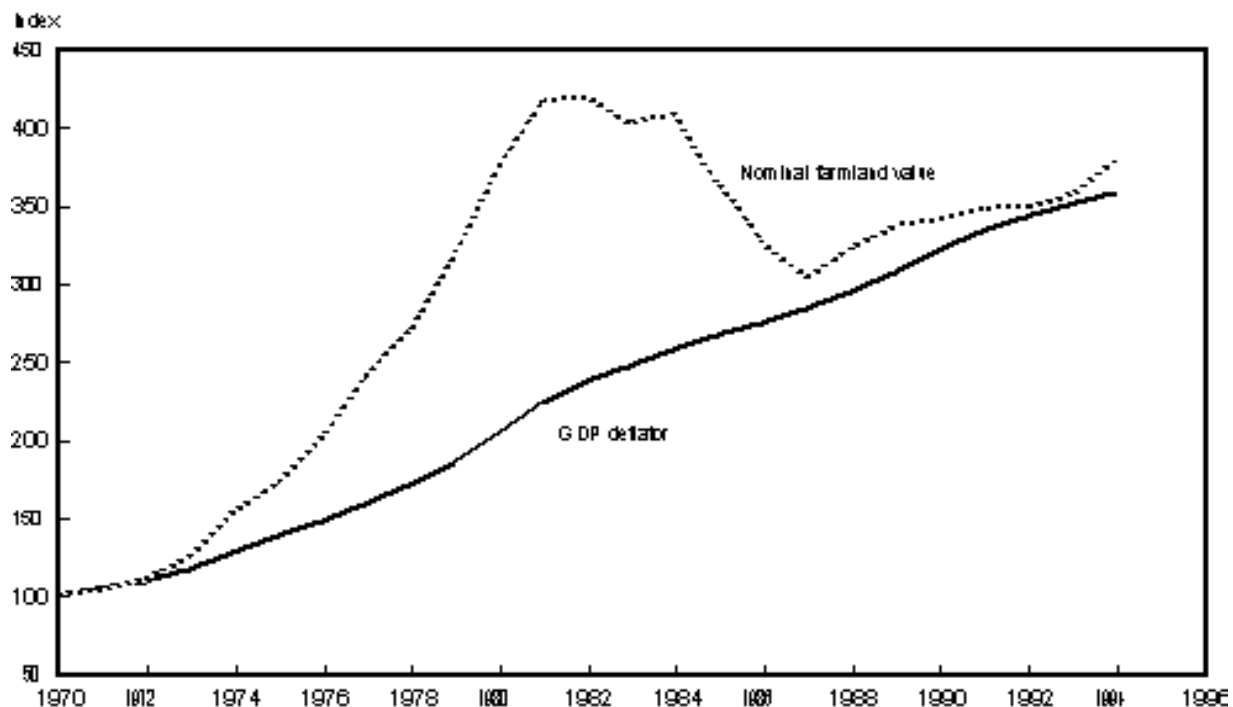
Explaining Farmland Price Volatility

There is a long and rich history leading to the modern development of empirical models designed to explain farmland values. Various theoretical analyses and numerous empirical econometric models have been employed to explain farmland

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Figure A-1

Index of average nominal value per acre of U.S. farm real estate (48 States) compared with the index of the Gross Domestic Product (GDP) implicit price deflator, 1970-84 (1970=100)



values. The research methods differ and the influencing variables, such as credit and debt, thus are considered in various ways. Much research has been conducted on the determinants of farmland prices with sometimes conflicting results.

By the late 1950's, agricultural economists were made most aware of the increasing importance of farm capital gains as farmland values continued to rise. A considerable body of literature arose to explain the discrepancy between agricultural productivity and market values of rural land. Economists debated the nature of this "supplement" to "normal" farm income and had differing opinions regarding the desirability of lumping capital gains and losses with ordinary income. Some felt capital gains were paper profits based on values obtained through the operation of a thin land market. A number of estimates of farm capital gains and losses were made, but they differed in scope, method, and concept.

The literature developed since that time includes an impressive list of factors that help determine farmland prices. These include inflation, farm income, government payments, capital gains, net rent, alternative investment opportunities, transfer rates of farmland, farm enlargement, rate of return on common stock, credit availability and terms, farm debt levels, commodity prices, input prices, yields, taxes, foreign buyers, and technological advances. It is easy to see why it is difficult to sort out the impacts of financial variables, such as credit, debt, interest rates, and related variables, in determining farmland prices. In a review of the research on farmland value determination, Robison and Koenig (1992) concluded the most remarkable feature about these studies is their lack of consensus (p. 212).

Still another recent theory of farmland values about which researchers disagree is speculative or rational bubbles. A speculative bubble is essentially an overreaction to current price information. During a speculative bubble, farmland owners and prospective buyers incorrectly infer from past experiences the future earnings stream from farmland and, consequently, farmland's future value. Speculative bubbles may cause farmland to be priced differently than its agricultural use value simply because the future is difficult to predict. This is important because some economists allege that farm mortgage lenders helped provide the credit that fueled a farmland price speculative bubble in the 1970's.

Price overreactions and price bubbles are not mutually exclusive concepts. The concept of a bubble, however, usually means a divergence between the actual market price and market fundamentals over a longer period. Price bubbles arise from three necessary conditions: durability, scarcity, and common beliefs. Farmland is durable and the market for farmland can become subject to common belief. But some analysts question the assumption that it is scarce in the sense that the supply is perfectly inelastic or that it is fixed (Tegene and Kuchler, 1990, pp. 4-5).

Several studies have been conducted in an attempt to see if the 1970's farmland price boom resulted from a bubble. Despite this work, the empirical questions regarding the existence of speculative bubbles remain to be resolved. The research on farmland investment decisions based on market fundamentals and the possibility of speculative bubbles demonstrates little consensus. Kuchler and Tegene (1990) wrote that "it is impossible to prove conclusively that bubbles do or do not

exist. Until economists can say exactly how fixed agricultural land is in agricultural production, no one will be certain how much income should be attributed to land" (p. 37).

Role of Credit in Inducing the 1970's Farmland Price Boom

Questions have been raised about the role of credit and whether easy credit from farm mortgage lenders, particularly the life insurance companies, FCS, and FmHA, helped spur the 1970's farmland price boom. The factors influencing the supply and demand of agricultural mortgage credit, farmland markets, and their interrelationship are complex. Hesser and Schuh (1963) hypothesized that the supply of credit offered to agriculture is a function of lenders' expectations concerning the ability of farmers to repay, but admitted it is not known how lenders formulate expectations (p. 840). They further hypothesized that lenders considered "real" prices of farm products and the value of agriculture's assets in deciding how much credit to extend.

Credit is only one of numerous variables possibly influencing farmland prices. The view of credit's significance by those persons conducting the various studies can be influenced by how it is regarded philosophically. Such views range from credit being a passive factor or a benign facilitator of economic change to it being an input carrying much associated risk and an active or causal influence on land values. The optimistic view is illustrated by this Congressional testimony delivered by Irwin in 1983:

I view credit as a facilitator of those changes that are being pressed on us by more basic economic, social, and political forces that directly affect the farm businesses of borrowers. In general, credit is not the cause of such changes, but the medium by which they are accomplished. Nor is it the job of a credit institution to impose its judgment on that of a borrower as he or she adapts to these forces, except when safety of the loan is involved. Thus, participation in general farm programs is ordinarily at the borrower's discretion. This leaves the entrepreneur the right to succeed or fail. It also means that sound overall credit may exist even when a borrower makes an unsound credit decision (p. 352).

The cautious view is epitomized by T.N. Carver's classic statement contained in the early editions of William Murray's *Agricultural Finance* textbook:

There is no magic about credit. It is a powerful agency for good in the hands of those who know how to use it. So is a buzz saw. They are about equally dangerous in the hands of those who do not understand them. Speaking broadly, there are probably almost as many farmers in this country who are suffering from too much as from too little credit. Many a farmer would be better off today if he had never had a chance to borrow money at all, or go into debt for the things which he bought. However, that is no reason why those farmers who do know how to use credit should not have it (p. 1).

Several studies address land values and include credit (and debt levels) in some manner. Reinsel and Reinsel (1979) analyzed the economics of asset prices and current income in

farming. They noted that a concentration of land ownership and wealth was occurring in agriculture. They also noted that it often has been argued that more lenient credit terms were required to ease the entry of young people into farming, but such terms only benefit the earliest buyers. They maintained that the cash flow and equity advantages are soon bid into the price of land. This means that with each relaxation of credit terms, land prices can be expected to rise more rapidly, then resume a normal pattern of change with future benefits discounted (p. 1096).

Shalit and Schmitz (1982) developed a model of farmland accumulation to study factors influencing U.S. farmland values. The model stressed the manner in which credit is allocated for land purchases. To secure the necessary loans for expanding farm size, the farmer provides his net accumulated wealth as collateral. In addition to income and consumption, Shalit and Schmitz found the level of accumulated debt is one of the main determinants of farmland prices. The effects of owner equity on farmland price thus was examined. A derived demand for farmland was estimated as part of a structural equation model. Shalit and Schmitz showed that as the banking system increases the supply of credit to farmers with land as collateral, land values rise at a faster rate than if no credit were available (p. 718). Thus, the expansion and contraction of credit importantly affects the pace at which land prices increase or decrease.

Brown and Brown (1984) examined the effect of current farm prices on farm buyers' expectations about the future distribution of purchasing bids. Results based on Corn Belt and Lake State data did not disprove their model's prediction that optimists' expectations dominated the farmland market. They did not find interest rates or credit availability to be highly important in explaining land values.

Hughes et al. (1984) employed a capital asset pricing (CAP) model to examine subsidized credit offered by FmHA and its impact on agriculture. It was an attempt to quantitatively evaluate the impacts of subsidized credit on the farm real estate market. They concluded that government farm subsidies likely increased farm real estate values, farmers' holdings of financial assets, and farm debt. They felt the short-run impacts of such government programs were small, but that over the long run, the government credit programs had probably increased farm sector wealth by hundreds of billions of dollars by increasing the price of farmland. In their view, it was highly unlikely that the rapid rise in farm real estate values during the 1970's should be attributed principally to government intervention on farm credit markets, but likely was caused by other factors such as the rapid increase in farm exports.

In contrast to Brown and Brown, Raup (1989) analyzed the most recent farmland boom and bust cycle and concluded that the driving force in the boom was a search for size economies by neighboring farmers. The "wisdom" of buying farmland was not restricted to farmers, but it infused their creditors as well. He noted that the conventional bid-price model used by creditors for valuing farmland encountered difficulty because of the rapid 1970's inflation and resultant negative interest rates. Real rates of interest on Federal Land Bank (FLB) farm mortgage loans were negative in 18 of the 32 quarters from 1973 through 1981 (Raup, p. 12).

Raup observed that booms in markets run on credit and, throughout the life of the 1970's farmland boom, credit was never a constraint (p. 8). It fueled the boom so that market-related debt was seen on a scale never before recorded in the United States (p. 9). In his view, this unique situation reflected an intense drive for market share by lenders, especially the FLB's, and to a smaller degree the Farmers Home Administration. Raup noted that life insurance companies were less aggressive until the mid-1970's when they reversed policies and became more active (p. 11). But he did not find life insurance lending to be as strong a driving force as that of the FLB's.

Carey (1990) believes that the heart of the 1970's farmland price boom and the 1980's farm credit crisis was the simultaneous existence of a land market deviation and a lender entity (FCS), organized as a cooperative, that was run by optimists about land prices. He feels that the FCS has a built-in propensity to finance land price deviations. This propensity is especially pernicious because the land market is especially vulnerable to deviations. By using the market price of an acre when determining its value as mortgage collateral, the FLB's took excessive risks.

Carey feels that, if the land market is always approximately efficient, the FCS does not appear especially likely to cause credit crises. But if land price deviations sometimes occur, the FCS is likely to be a destabilizing institution. He feels that the 1970's land price deviation was the result of excessive optimism about future farm income and land prices on the part of some agents in a market where optimistic agents set prices. The FLB's clearly did not respond in a risk-averse fashion to the associated risk.

Carey concluded that there is no evidence that the FCS deliberately financed or caused the credit crisis. Rather, the absence of all the usual risk control mechanisms from the FCS made it natural not to notice that it was setting up a credit crisis. He notes that lenders can prevent deviation-induced credit crises if they assess land at its fundamental productive value, but they probably cannot prevent the deviation itself. Lenders only amplify deviations and do not in general create them.

Carey believes that evidence on the behavior of farm lenders other than the FCS does not support a firm conclusion. Commercial lenders did not withdraw completely from farm mortgage markets, but they did not make more new loans than the flow of old loan repayments. Thus, they also took excessive risks, although not to the same extent as the FLB's. He feels that the lender with the worst structure (FLB's) was most to blame. The failure of other lenders to increase their loans outstanding as rapidly as the FLB's may have been due to FLB's lower interest rates, and to the effects of disintermediation on fund availability at insurance companies and commercial banks. He feels that there is no evidence of a general recognition by commercial lenders that a deviation was in progress and that risk-avoidance strategies were required.

Ely and Vanderhoff (1990) in a study funded by the American Bankers Association were aggressively critical of the FCS, calling it a reckless lender to rural America that fueled a disastrous 1970's boom and 1980's bust in farmland prices.

They blamed the Farm Credit Act of 1971 for liberalizing the collateral requirements and unleashing a farmland price boom. They regard the FCS during the 1970's an imprudent lender. Debt-financed investments in farmland were made attractive and "This leveraging opportunity greatly stimulated the demand that inflated the enormous bubble in farmland values that finally burst in 1980" (p. 18). They feel that the low real interest rates of the 1970's, fed by plentiful quantities of credit "helped create a financial environment in which land values could skyrocket" (p. 19). Other lenders, in their view, including a specific reference to life insurance companies, were more cautious in their approach to the farm sector developments of the 1970's and earlier (pp. 1, 10).

Just and Miranowski (1993) developed a structural model of farmland prices based on 1963-86 data which included the multidimensional effects of inflation on capital erosion, savings-return erosion, and real debt reduction as well as the effect of changes in the opportunity cost of capital. The results showed that inflation and changes in real returns on capital are major explanatory factors in farmland price swings. In addition, Just and Miranowski explicitly studied the effects of credit market constraints and expectations schemes in the analytical model. Their model estimated only minor effects of credit availability on land prices (p. 167). Their observations also suggest that the farm debt bubble may have occurred more as a consequence of high land values than as a causal factor (p. 157).

Conclusions

The extensive farmland value literature contains an impressive list of factors that help determine farmland values. However, the list of price determinants from these studies is so long that it is evident why it is difficult to sort out the impacts of financial variables, such as credit, debt, interest rates, and related variables in determining farmland values.

The remarkable feature about these studies is their lack of consensus. Agricultural economists have tended to develop farmland value models that for a given study and data set always appear able to "predict" or were deemed successful in the eyes of the authors. At the individual study level, the work appears to be quite encouraging. But even though many of the land value models appear to work on the data at hand, they fail once applied to a different data set or to the same data set for a different time period.

Speculative or rational bubbles, which have been discovered and studied in recent years, are another factor that can influence farmland values. A speculative bubble is essentially an overreaction to current price information. Several studies have been conducted to see if the 1970's farmland price boom resulted from a bubble. The empirical questions concerning the existence of speculative bubbles remain to be solved. Research on farmland investment decisions based on market fundamentals and the possibility of speculative bubbles shows little consensus.

The research to date concerning the role of credit in the 1970's farmland price boom also is inconclusive. Credit is only one of numerous factors influencing farmland values and it is difficult to isolate a single variable. It appears that credit is more than a benign facilitator but one finds it most difficult to

make definitive conclusions concerning the 1970's. Critics of farm mortgage lenders maintain that their extension of excess credit with generous terms fueled higher land prices than market fundamentals justified. Their defenders, however, say that the lenders extended credit to willing borrowers under a rational economic scenario that included both current and capital gains from farmland. Lenders were just responding to a shift in credit demand.

Research demonstrates that the study of the relationship between mortgage credit and farmland values is extremely complex. Even in the narrowest sense the demand for mortgage credit to finance farmland as a productive asset is a derived demand conditional on the demand for farmland and all other inputs and output supply. Such credit is used as a means of obtaining control of land as an asset, but farmland has a number of other facets as a resource. Thus, it has been very difficult to isolate the effects of mortgage credit use on farmland values. One of the most important failings of many farmland value studies is the failure to recognize that farm income may not be adequate to explain agricultural land's market value.

Problems in conducting predictive farmland value research have arisen for a variety of reasons, including a heavy emphasis on ex post facto analysis of secondary data using formal frameworks. Attempts to replicate results of earlier land value studies have concluded that previously published models did not accurately reflect the relevant structural changes and other characteristics of the farmland market. Robison and Colyer (1994) concluded that the earlier studies did not produce cumulative knowledge or learning. They believe that instead of building refutable models, agricultural economists have constructed increasingly complex methodologies applied to fragile nonreplicable data sets that produce uninteresting results.

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